

MISSOURI DEPARTMENT OF NATURAL RESOURCES  
P.O. Box 1368  
Jefferson City, Missouri 65102  
(314) 751-3241

3.600 . Louis County  
West Lake Sanitary Landfill

MEMORANDUM

Date: July 2, 1980

To: Tom Ellis, C.O., SWMP

From: Mike Duvall, SLRO MD

Subject: West Lake Sanitary Landfill leachate system

RECEIVED

JUL 8 1980

SOLID WASTE  
MANAGEMENT PROGRAM

Tom, this is to advise that our Water Pollution Control Program section have completed their staff review of the above referenced project.

I have discussed this matter with them and it can be summarized as follows:

1. We have given the required approval for the sewer extension to tie into the Metropolitan St. Louis Sewer District trunk line. A construction permit will be issued for this shortly.
2. We have no particular comments on the pre-treatment system design per se. The salient point here is that Metropolitan St. Louis Sewer District has approved the facilities for acceptance into their sewer system; apparently they are satisfied that the trunk sewer and treatment plant at the end of the line can handle the additional load without significant adverse impact. In other words, if Metropolitan St. Louis Sewer District is satisfied in this case, then so are we.

For your further reference, I am also enclosing a copy of the comments from the project consultant to our staff, in response to our reviewing engineer's inquiry. I believe these highlight the key components of the design.

I trust you already have a copy of the layout plans from Dave Murray.

MD/dak

enclosure

Site:	West Lake AL2
ID #	MB007990932
Break:	12.8
Other:	7.2.80

40241258



SUPERFUND RECORDS

Joseph P. Teasdale Governor  
Fred A. Lafser Director

Division of Environmental Quality  
Robert J. Schreiber Director

DNR 0085

JUN 13 1980

**REITZ & JENS, INC.**  
CONSULTING ENGINEERS

HENRY M. REITZ, PRESIDENT  
STIFEL W. JENS, SENIOR VICE PRESIDENT  
JOHN J. BAILEY, JR., VICE PRES., CHIEF ENG.  
DAVID E. MURRAY, VICE PRESIDENT  
DONALD S. ESKRIDGE, SECRETARY

111 SOUTH MERAMEC AVENUE  
St. Louis, Missouri 63105

(314) 727-0403

SOIL MECHANICS-FOUNDATIONS  
HYDROLOGY-HYDRAULICS  
RESOURCE RECLAMATION  
DRAINAGE-PAVEMENTS  
LAND DEVELOPMENT  
WATER RESOURCES  
SOLID WASTE

June 17, 1980

Mr. R. Blane Work  
St. Louis Office, Mo. DNR  
8460 Watson Rd.  
St. Louis, MO 63119

Re: West Lake Sanitary Landfill

Dear Mr. Work:

This is in reference to your letter of June 11, 1980 concerning the West Lake Treatment Facilities for handling landfill leachate at West Lake Quarry.

Leachate cannot be discharged directly to the adjacent MSD sanitary sewer system at the lift system at Old St. Charles Rock Rd. because this sewer line goes to the Bonfils lagoon which should not have additional sludge-producing wastes. The leachate is presently being hauled by truck to MSD's Bissell Point Plant.

To be acceptable to MSD it was necessary to provide a pre-treatment system to process the leachate into wastewater treatment effluent equivalent to domestic sewage with respect to organic load. A series of laboratory studies were conducted by Environmental & Energy Consultants, Inc. to determine treatability of the leachate and additional laboratory studies were required to investigate biological treatment and better establish treatment parameters.

The treatment plan calls for chemical treatment followed by biological treatment to reach a level of heavy metals and organics acceptable to discharge to MSD's system. Tests show this treatment process will produce an effluent equivalent to domestic sewage with respect to organic load (see enclosed copy of Environment & Energy Consultants letter dated 12/17/79).

The West Lake treatment system will consist of the following:

1. Leachate will be pumped from the pit at the south end of the active landfill to the treatment facility (pump capacity is 50 gpm or 3,000 gph).
2. The chemical treatment unit is a #3 type NS Accelerator manufactured by Infilco Degremont, Inc. this is a solids contact unit with upflow clarification which will ensure maximum quality effluent with minimum chemical treatment.

The addition of hydrated lime in the Accelerator unit (approximately 30 lbs. per 1,000 gallons) will drop out heavy metal sludge. Sludge discharge will be directed to sludge drying beds near the basins. Effluent leaving the Accelerator (approximately 40 gpm or 2,400 gph) will enter basin #1.

3. Basin #1 is a biological treatment lagoon providing over three days' detention and using four 10-hp Aer-O-Lator, Inc. floating mechanical aerators.

4. Basins #2 and #3 are settling lagoons providing over one days' detention including sludge storage. These can be used in series or alternately with one in operation while the other is being cleaned.

5. Effluent discharge from basins will go through the metered manhole into the MSD sewer.

Present plans call for running the treatment system 16 hours a day, 6 days a week (2,400 gph or 38,400 gpd). Attached are copies of a schematic drawing of the West Lake treatment system and the MSD Industrial Wastewater Survey sheet.

Also enclosed, for your review and approval is the Construction Permit application for the sanitary sewer line and the check for \$25.00 filing fee.

If there are any questions, please call.

Very truly yours,

  
DAVID E. MURRAY

Encl.  
DEM/rs  
cc: West Lake Quarry

# Environment Energy Consultants

2360 SEVENTH BOULEVARD / ST. LOUIS, MISSOURI 63104 / 314-773-0068

December 17, 1979

Study wastewater from quarry pit to show and treatment

Mr. Dave Murray  
Reitz & Jens, Inc.  
111 South Meramec Avenue  
St. Louis, Mo. 63105

RE: Westlake Quarry Landfill Leachate Treatability Studies

Dear Dave:

At your request a series of laboratory studies have been conducted to determine the treatability of the leachate that emanates from the Westlake Quarry Landfill. Preliminary studies had shown that the leachate is amenable to chemical treatment for removal of heavy metals and some organic matter. Additional studies were required to investigate biological treatment and better fix chemical treatment parameters.

Leachate samples were delivered to our laboratories and they form the basis for the studies reported here. The material is a black liquid with a strong pungent odor. Laboratory analyses showed it to have a high metals content and very high organic concentration. Actual levels measured are reported in the attached table of laboratory results. The waste was adjusted to pH 10.2 in order to precipitate the heavy metals along with any organic matter that might come out with the precipitate. The precipitated waste has been fed to a fill and draw activated sludge unit in order to acclimate the biological organisms to the waste and ultimately determine the ability of the biological system to significantly remove organic matter from the waste. All results are presented in the attached table.

A logical treatment scheme for this waste in order to achieve levels of heavy metals and organics acceptable to the Metropolitan Sewer District for discharge to their system would include chemical treatment followed by biological treatment. In considering specific treatment units, consideration was given to ease of operation, availability of space, minimizing of chemical usage, salvage value of equipment and flexibility to accommodate waste variability, both volume and chemical characteristics. The following flow scheme is proposed:

# Environment Energy Consultants

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Mr. Dave Murray

-2-

December 17, 1979

1. Pump wastewater from quarry pit to chemical treatment unit.
2. Chemical treatment unit consisting of a #3A type "NS" Accelerator manufactured by Infilco Degremont, Inc. This is a solids contact unit with upflow clarification which will assure maximum quality effluent with minimum chemical requirement.
3. Biological treatment pond providing a minimum of three days' detention and utilizing four Air-O-Lator, Inc., Model SA-100 floating mechanical aerators.
4. Two settling ponds each capable of providing a minimum of one day's detention, including sludge storage. These ponds would be used alternatively with one in operation while the other is being cleaned.
5. Discharge from settling pond to MSD sewer.

Laboratory tests indicate that the above treatment scheme should provide a discharge water having an iron concentration of less than 10 mg/l, zinc less than 1 mg/l and a B.O.D. less than 300mg/l. In-line requirements to reach a pH 10.2 require approximately 30 pounds per 1,000 gallons of leachate. This might be reduced because of the high recirculation feature of the Accelerator unit.

As additional data is needed we will do our best to provide it.

Sincerely,

ENVIRONMENT & ENERGY CONSULTANTS, INC.



E. Edgerley, Jr., Ph.D., P. E.  
President

EE/mn  
enc.

# Environment Energy Consultants

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Table 1  
WESTLAKE LANDFILL LEACHATE  
TREATMENT CHARACTERISTICS

<u>Parameter</u>	<u>Raw Leachate</u>	<u>Chemical Treatment</u>	<u>Biological Treatment</u>
pH	5.6	10.2	
Iron	70	1.2	
Zinc	4	0.2	
C.O.D.	18,000	11,000	400**
*B.O.D.		3,200**	70**

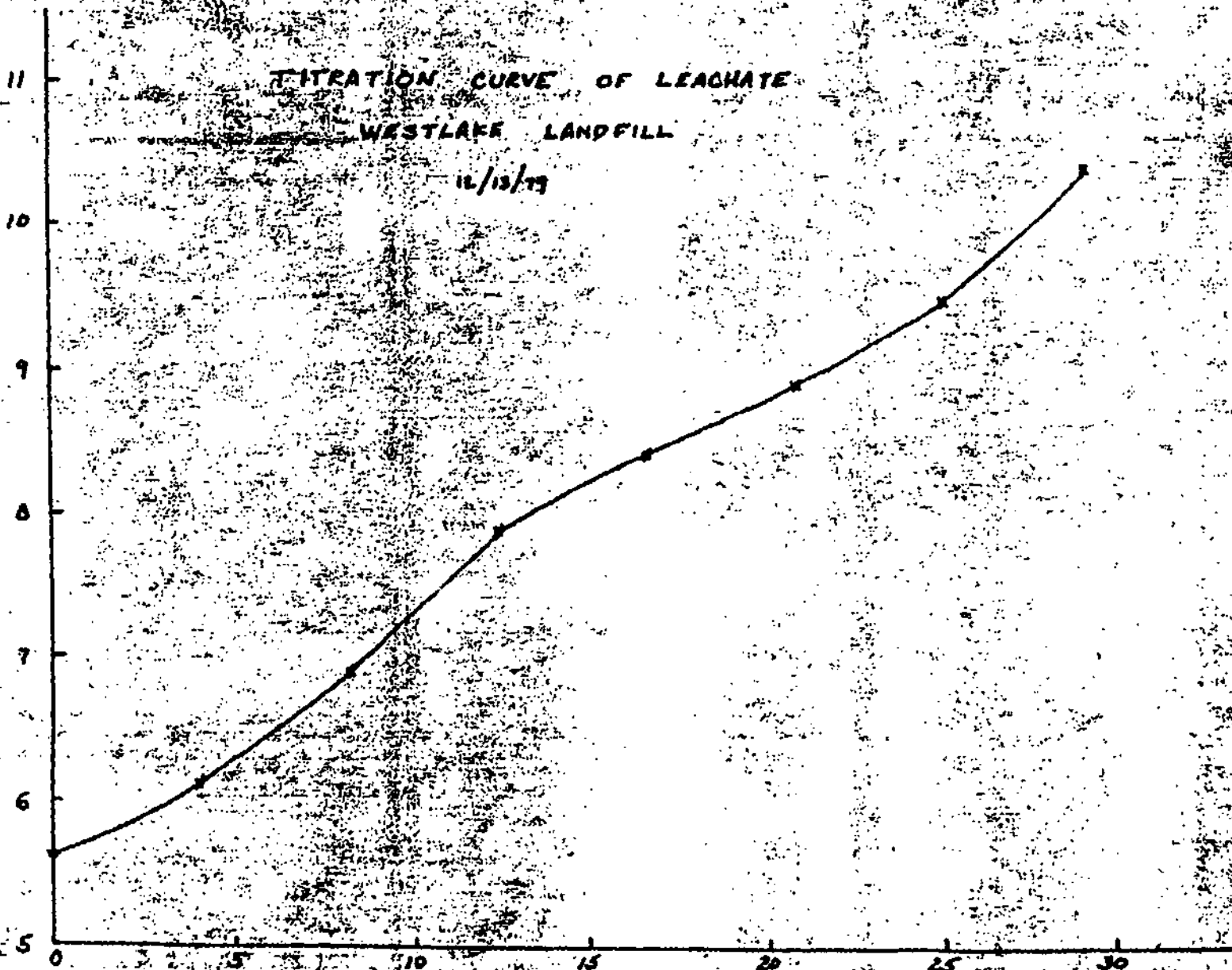
• using acclimated seed

• feed diluted 3/1 with effluent

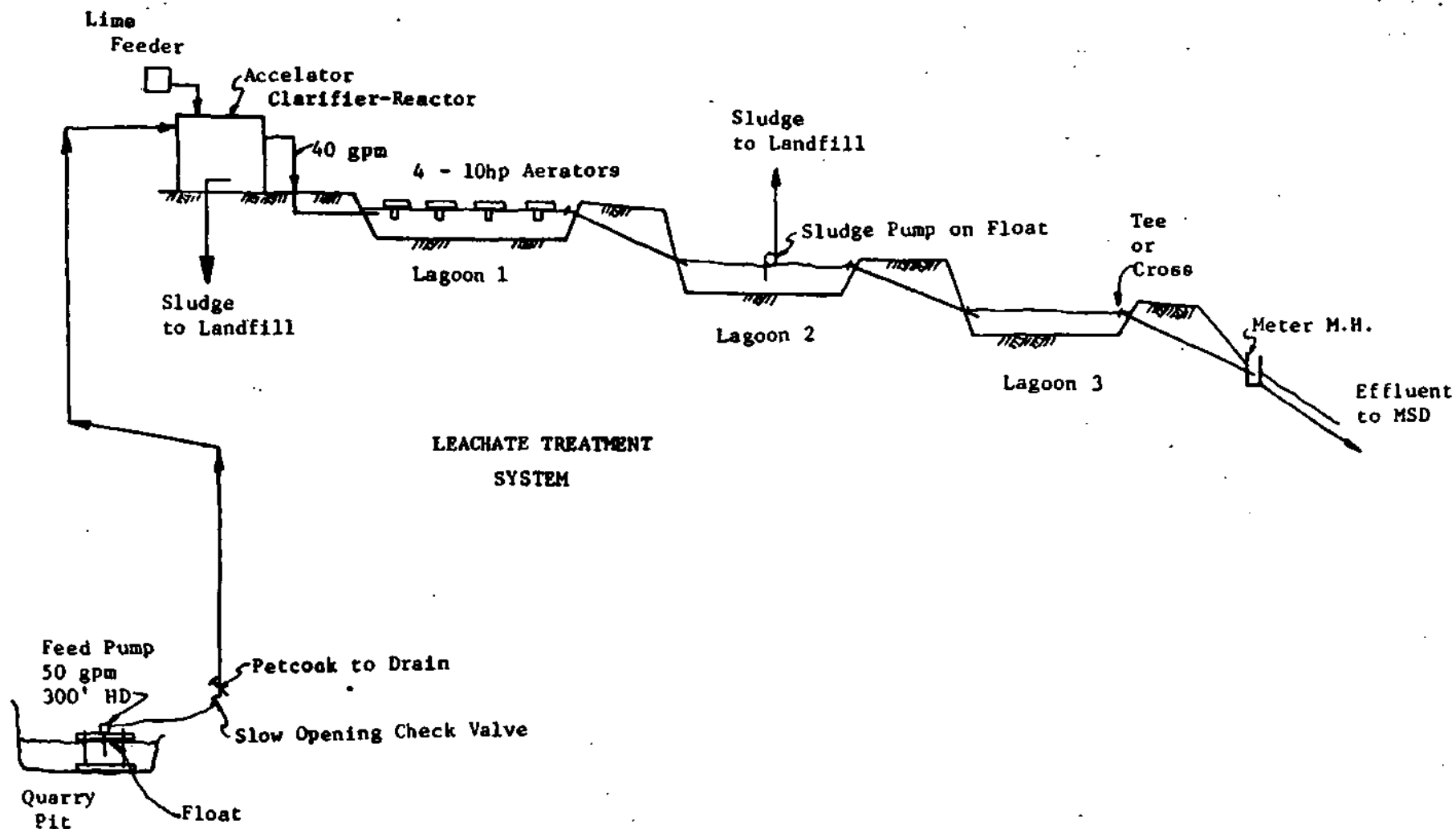
TITRATION CURVE OF LEACHATE  
WESTLAKE LANDFILL

12/13/79

pH



lime as  $\text{Ca(OH)}_2$  - pounds/1000 gal.



WEST LAKE QUARRY

REITZ & JENS, INC.  
Jan. 1980

METROPOLITAN ST. LOUIS SEWER DISTRICT  
Industrial Waste Division  
INDUSTRIAL WASTEWATER SURVEY

Company Name WEST LAKE QUARRY & MATERIALS CO. Date May 8, 1980  
Address 13570 St. Charles Rock Rd., Bridgeton, MO 63044 Phone 739-1122  
Person to Contact William J. McCullough Title Executive Vice Pres.  
Alternate Contact William H. Canney Title Supervisor

1. RAW MATERIALS & CHEMICALS (itemize): Landfill leachate

2. PROCESSES (Brief Description): Wastewater treatment effluent will be equivalent to domestic sewage with respect to organic load.

3. PLANT OPERATION: No. of Shifts and Times \_\_\_\_\_  
No. Employ./Shift 1 Work Days/Week 6 Work Hours/Week \_\_\_\_\_  
Months of Peak Operation Steady operation

4. PRODUCTS (itemize): N/A

5. WASTE WATERS:  
a. Quantity \_\_\_\_\_ b. Characteristics (itemize): \_\_\_\_\_  
Ave. \_\_\_\_\_  
Max: 40 gpm (2400 gph) x 16 hr. = 38,400 gal./day  
How Est. \_\_\_\_\_  
c. Disposal Methods Sludge to be landfilled on site. Effluent to MSD.  
d. Possible Spills \_\_\_\_\_  
e. Treatment or Recovery \_\_\_\_\_

6. SEWER OUTLETS (Furnish Plumbing Plan or Sketch, showing number, size & location)  
6-inch diameter. See Layout of Treatment Facilities

7. WATER USAGE:  
a. Source \_\_\_\_\_ b. Volume \_\_\_\_\_ c. Use \_\_\_\_\_  
N/A \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. ATTACH RESULTS OF ANY WASTEWATER ANALYSES: (i.e., pH, Suspended Solids, etc.)

9. REMARKS: See attached sheet.

10. INFORMATION FURNISHED BY:

a. Name David E. Murray  
b. Title Vice President, Reitz & Jens, Inc.